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EXAMINER

SMOOT, STEPHEN W

ART UNIT PAPER NUMBER

2813

DATE MAILED: 09/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/932,406

Applicant(s)

BOLING ET AL.

Examiner

Stephen W. Smoot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 12-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

This Office action is in response to application papers filed on 17 August 2001.

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-11 are drawn to a display device, classified in class 257, subclass 72.
  - II. Claims 12-24 are drawn to a method of dispensing a slurry containing a plurality of display drivers onto a substrate, classified in class 438, subclass 20.
  
2. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by another and materially different process, such as by forming the display drivers directly on the

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substrate instead of the as-claimed process which includes the step of depositing prefabricated display drivers on the substrate.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with James C. Scheller, Jr. on 20 September 2004 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-11. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Drawings***

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character not mentioned in the description:
- 917 in Fig. 1.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The drawings are objected to because:

In Fig. 2, change reference number "28" to --913-- because the emitters are designated as 913 in the specification (see paragraph [0013]);

In Fig. 9, change the upper appearance of reference number "907" to --22-- because a substrate is designated as 22 in the specification and reference number "907" is also used to designate barrier ribs (see paragraph [0020]);

Paragraphs [0085] and [0086] refer to Fig. 14F, but there is no Fig. 14F included with the drawings and the Brief Description of the Drawings section does not include a description of Fig. 14F;

In Fig. 19, change reference number "22" to --22A-- because the display backplane is designated as 22A in the specification (see paragraph [0091]); and

Paragraph [00100] refers to Fig. 31, but there is no Fig. 31 included with the drawings and the Brief Description of the Drawings section does not include a description of Fig. 31.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of

the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

8. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because in Fig. 12F, reference characters "54" and "58" have both been used to designate the insulating layer (see paragraph [0083]).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

9. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

669 in Fig. 27B (see paragraph [00100]);

679 in Fig. 27C (see paragraph [00100]); and

665 in Fig. 27F (see paragraph [00101]). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

10. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

11. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Display Device with an Array of Display Drivers Recessed Onto a Substrate.



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12. The disclosure is objected to because of the following informalities:

In paragraph [0087], line 2, change "substrate 80" to --substrate-- because reference number 80 is used in Fig. 15 to designate an operation;

In paragraph [0091], lines 3-4, delete the redundant appearance of "at operation";

Update paragraph [00100] to indicate that US application serial number 09/270,165 is now US 6,281,038;

Update paragraph [00108] to indicate that US application serial number 09/270,157 is now US 6,555,408;

Update paragraph [00112] to indicate that US application serial number 09/270,146 is now abandoned;

Update paragraph [00113] to indicate that US application serial number 09/270,157 is now US 6,555,408;

Update paragraph [00114] to indicate that US application serial number 09/270,159 is now US 6,316,278;

Update paragraph [00115] to indicate that US application serial number 09/270,147 is now US 6,274,508;

Update paragraph [00116] to indicate that US application serial number 09/268,755 is now US 6,468,638; and

Update paragraph [00117] to indicate that US application serial number 09/270,165 is now US 6,281,038.

Appropriate correction is required.

***Claim Objections***

13. Applicant is advised that should claim 2 be found allowable, claim 9 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

14. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

15. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the plurality of display drivers coupled to a first substrate" in lines 1-2. There is insufficient antecedent basis for this limitation in claim 6.

***Claim Rejections - 35 USC § 102***

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. Claims 1, 3, 6-7, 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Haas (US 6,111,555).

Referring to Figs. 1-3 and column 4, line 32 to column 8, line 45, Haas discloses a plasma display panel with the following features:

- A back glass substrate (24) with an inner surface (36) that includes gas discharge troughs (38) and barrier ribs (40);
- Elongated back electrodes (42) (i.e. rods) formed within the gas discharge troughs (38);
- A front glass substrate (22) with an inner surface (28) that includes elongated front electrodes (30);
- The back electrodes (42) and front electrodes (30) extend in transverse directions from each other and their intersections define pixels (46);

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- The front glass substrate (22) includes an electrical driver formed on an integrated circuit chip (60); and
- The plasma display panel has a uniform voltage applied to the entire panel during sustain periods and has selective address voltages for driving individual pixels during address periods (also see column 1, lines 16-51).

These are all of the structural limitations set forth in claims 1, 3, 6-7, 10-11 of the applicant's invention. It is noted that claims 1, 3, 6, 11 have product-by process limitations, regarding the formation of features on a first substrate, that do not appear to be distinguishable from the above structure disclosed by Haas (see MPEP section 2113 regarding the examination of product-by-process claims).

### ***Claim Rejections - 35 USC § 103***

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claims 1-2, 6-7, 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi et al. (US 6,005,345) in view of Haas (US 6,111,555).

Referring to Figs. 2F, 3 and column 2, line 66 to column 4, line 20, Choi et al. disclose a plasma display panel with the following features:

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- A bottom transparent substrate (10') with striped grooves to form barrier ribs that define pixels of the plasma display (also see column 1, lines 12-26);
- Vertical transparent electrodes (12) (i.e. rods) formed in each of the striped grooves;
- Striped horizontal electrodes (15) with supports (17) (i.e. spacers) formed over the bottom substrate (10'); and
- A top transparent substrate (not shown) formed over the bottom substrate (10').

These are structural limitations set forth in claims 1-2, 6-7, 9-11 of the applicant's invention. It is noted that claims 1-2, 6, 9, 11 have product-by process limitations, regarding the formation of features on a first substrate, that do not appear to be distinguishable from the above structure disclosed by Choi et al. (see MPEP section 2113 regarding the examination of product-by-process claims).

However, Choi et al. do not expressly teach or suggest the first voltage driver limitation as set forth in claim 1 of the applicant's invention.

Haas teaches that plasma display panels have a uniform voltage applied to the entire panel during sustain periods and have selective address voltages for driving individual pixels during address periods (see column 1, lines 16-51).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings Choi et al. and Haas in order to include a voltage driver as taught by Haas. Haas recognizes that a voltage driver is used in plasma display panels for illuminating selected pixels (see column 1, lines 35-43).

20. Claims 1-2, 6, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malhi (US 5,818,165) in view of Watkins et al. (US 6,133,689).

Referring to Figs. 1-4 and column 2, line 10 to column 6, line 14, Malhi discloses a flexible field emission device (FED) with the following features:

- A cathode element (14) that includes gate electrode layer (36);
- Microtips (52) (i.e. emitters) formed within cavities (54) formed through the gate electrode layer (36);
- The microtips (52) are arranged in an array of clusters (38) that define a plurality of image pixels (57) as shown in Figs. 3, 4; and
- A flexible frit (50) (i.e. spacers) separates the cathode element (14) from an overlying anode element (12).

These are structural limitations set forth in claims 1-2, 6, 8-11 of the applicant's invention. It is noted that claims 1-2, 6, 9, 11 have product-by process limitations, regarding the formation of features on a first substrate, that do not appear to be distinguishable from the above structure disclosed by Malhi (see MPEP section 2113 regarding the examination of product-by-process claims).

However, Malhi does not expressly teach or suggest the first voltage driver limitation as set forth in claim 1 of the applicant's invention.

Watkins et al. teach that field emission displays in operation use a field emission display driver to respond to control signals by outputting a cathode voltage, a source voltage, and an anode voltage (see column 4, lines 8-24).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings Malhi and Watkins et al. in order to include a field emission display driver as taught by Watkins et al. Watkins et al. recognize that a field emission display driver is used to operate the field emitters in order to emit light for illuminating the display (see column 4, lines 20-24).

21. Claims 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malhi (US 5,818,165) and Watkins et al. (US 6,133,689) as applied to claim 1 above, and further in view of Shanks et al. (US 5,821,688).

As shown above the combination of Malhi and Watkins et al. has all of the limitations set forth in claim 1 of the applicant's invention. However, this combination does not expressly teach or suggest attaching the flexible field emission device of Malhi to either a planar object (the further limitation to claim 1 set forth in claim 4) or to a non-planar object (the further limitation to claim 1 set forth in claim 5). Shanks et al. teach the attachment of a flexible display panel to a flat display or to a curved display (see Fig. 4 and column 5, lines 37-43).

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings Malhi, Watkins et al., and Shanks et al. in order to form either flat or curved displays as taught by Shanks et al. Shanks et al. recognize that a flexible display panel will conform to the shape of a variety of surfaces (see column 5, lines 40-43).

***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Primm and Uenuma teach field emission device structures. Hadley et al. teach display structures that feature integrated circuit blocks formed in recessed portions of a flexible substrate.

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

*Stephen W. Smoot*  
Patent Examiner  
Art Unit 2813